



Contact: Shelley Dawicki  
508-495-2378  
[Shelley.Dawicki@noaa.gov](mailto:Shelley.Dawicki@noaa.gov)

FOR IMMEDIATE RELEASE  
April 27, 2010

## **R.I. Floods May Have Positive Impact on Commercial Fish, Shellfish Industries**

### *Low salinity waters led to record phytoplankton bloom*

While the record floods that struck Rhode Island in late March and early April caused significant damage and disruption, there may be one positive effect. The flood runoff into Narragansett Bay may improve the health of the Bay's fisheries.

Scientists at the Narragansett Laboratory of NOAA's Fisheries Service have been assessing the changing conditions of Narragansett Bay on a monthly basis for the past 12 years in collaboration with the Rhode Island Department of Environmental Management and the University of Rhode Island.

Using a towed sampling system called the Mariner Shuttle, the monthly surveys record biological, chemical, and physical characteristics of the Bay's ecosystem from surface to bottom. Researchers have used the survey data to construct a baseline of normal conditions over the course of a year. The conditions found on the April 8 survey, days after the torrential rains, were far from normal.

"The flood runoff produced the lowest salinity surface water and the highest April concentrations of phytoplankton ever measured during the 12 years of the study," said Mark Berman, an oceanographer in the Laboratory's marine ecosystems group. "A week after the flooding, the low salinity surface plume was evident all the way to the mouth of Narragansett Bay."

Berman and colleagues at the Narragansett Laboratory designed and operate the Mariner Shuttle, which measures key water quality parameters including temperature, salinity, density, oxygen concentration, and light penetration. The sampling system also assesses the water's nutrient content, and the quantity and growth rate of phytoplankton or microscopic algae that form the base of the marine food web. The Mariner Shuttle also samples zooplankton, the small floating animals that serve as a key link between phytoplankton and fish.

"Phytoplankton need both light and nutrients to grow and reproduce," said Chris Melrose, a biological oceanographer who works with Berman on the project. "Sewage and other materials carried by the flood runoff into the Bay's surface layer provided the nutrients, and the difference in density between the more salty ocean water and the fresher surface water helped to keep the phytoplankton near the surface, where there was plenty of light. The result was a record phytoplankton bloom."

Berman said the bloom has potentially two beneficial impacts on the environment: phytoplankton act as a natural filter, consuming the excess nutrients from sewage overflows, and they produce an enormous amount of food for the ecosystem.

“Some of the food produced will be consumed by animals in the water column, but a large fraction will sink to the bottom, nourishing bottom dwelling organisms such as quahogs and other shellfish. In turn, these organisms will provide months of food for other marine life. The flooding is likely to benefit Narragansett Bay’s commercial finfish and shellfish industries for some time to come.”

The timing of the flood was also a critical, and positive, factor. “During the summer when phytoplankton blooms also occur, bacteria are more active and consume much of the bloom before it can become food for the benthic animals,” Berman said. “Bacteria also deplete oxygen in the water, resulting in hypoxic events such as the one in August 2003 in which millions of oxygen-starved fish and invertebrates washed up dead on the Bay’s beaches. When the water is cold, as occurred during the spring 2010 flood, the bacteria do not consume the phytoplankton quickly enough to deplete the dissolved oxygen in the water.”

The Narragansett Laboratory is one of six research facilities from Maine to Washington, D.C., that comprise the Northeast Fisheries Science Center (NEFSC), one of six regional NOAA Fisheries Service science centers in the U.S. Administrative headquarters for the NEFSC are located at the Woods Hole Laboratory in Woods Hole, Mass.

# # #

Related links:

Narragansett Bay monitoring (map and data):

[http://www.narrbay.org/d\\_projects/nushuttle/shuttletree.htm](http://www.narrbay.org/d_projects/nushuttle/shuttletree.htm)

Mariner Shuttle: <http://seagrant.gso.uri.edu/41N/Vol3No1/berman.html>